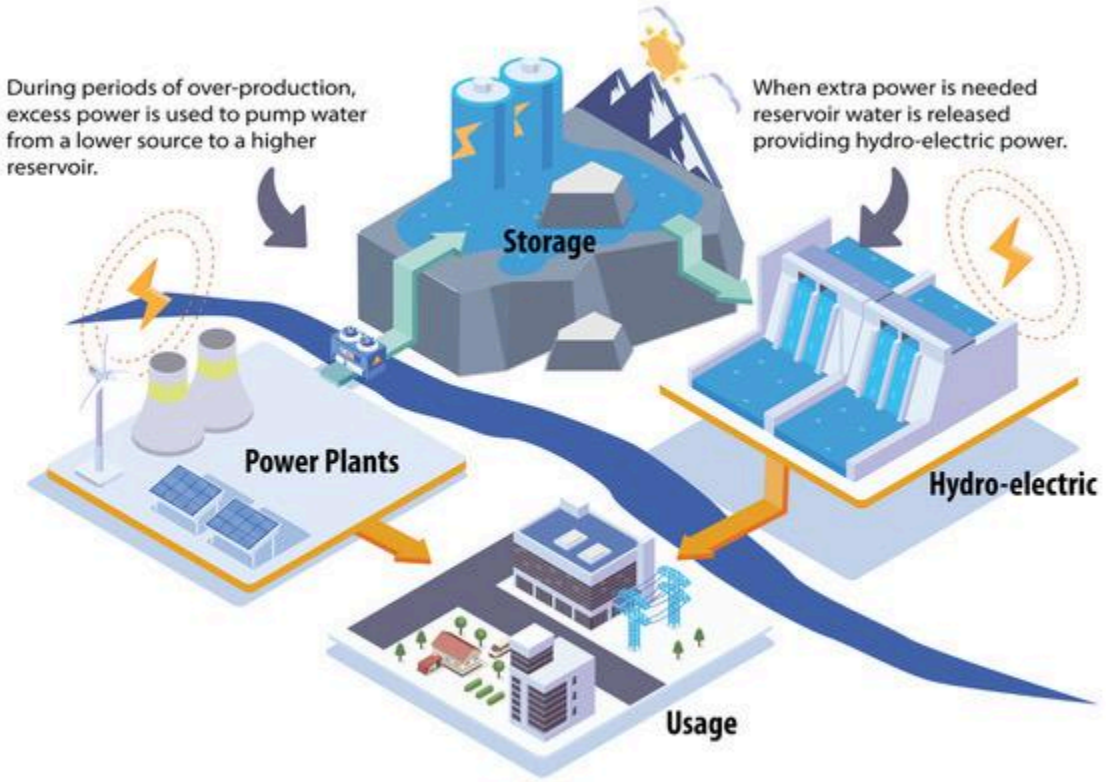
Powering Prosperity and Security: A Vision for Cross-Border Collaboration in Clean Energy

By Dr. Jeff Kleck

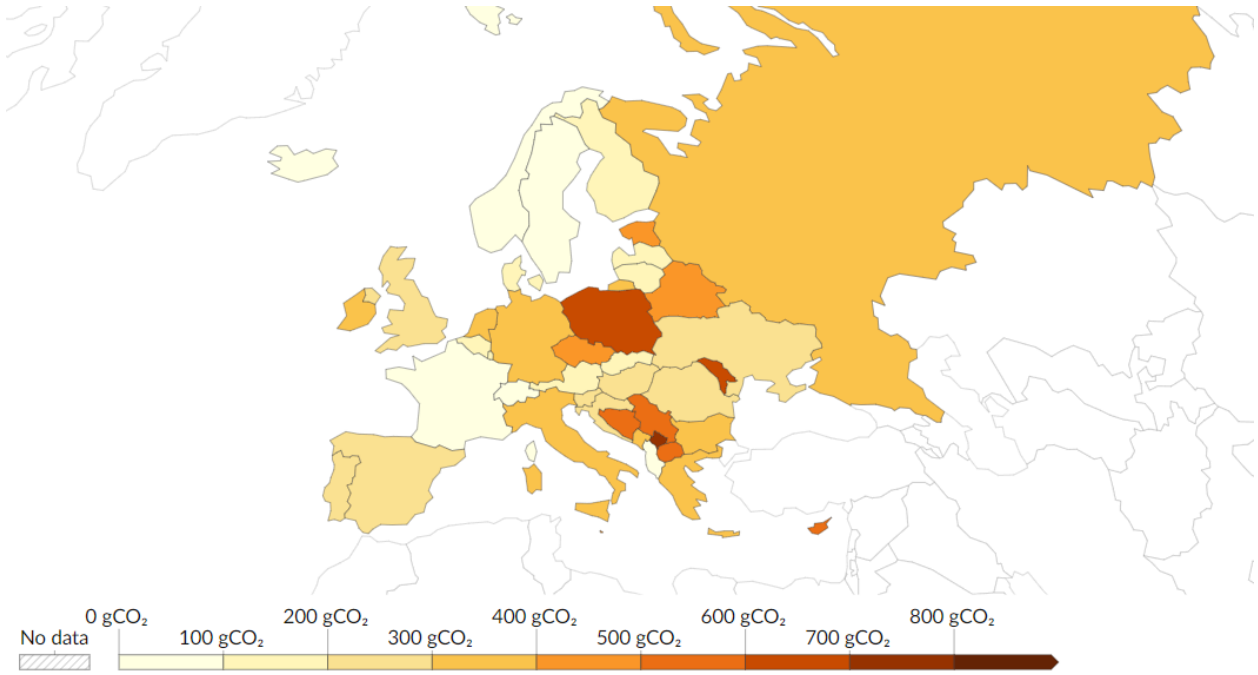
In an era where access to reliable, affordable power is vital for economic strength and national security, an innovative opportunity emerges along international borders—one that can address the challenges of the underperforming Texas power grid while bolstering energy security for the United States. Drawing on the example of successful international partnerships, such as the “Battery-of-Europe” collaboration between France and Switzerland, this framework envisions binational cooperation on power generation, storage, and distribution. The result is an integrated energy strategy aimed at ensuring ample electricity for growth, innovation, and prosperity on both sides of the border.



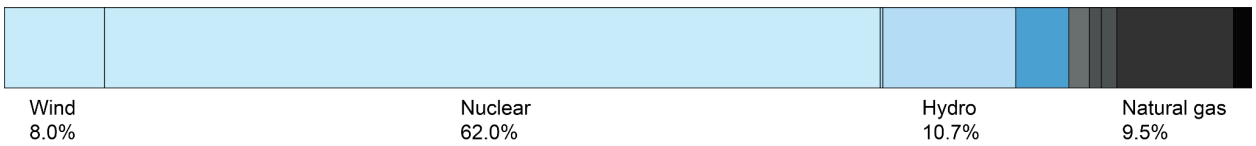
The Battery-of-Europe Nuclear and Hydroelectric collaboration between France and Switzerland (SwissInfo, 2021)

The Power of Collaboration:
The concept of the **"Economic Battery"** borrows from Europe's proven model, in which one nation's surplus nuclear power continuously operates at high efficiency, while its neighbor manages complementary energy storage. France provides near-zero-carbon electricity from nuclear plants, sending excess power during off-peak times to Switzerland, which uses it to pump water into higher-elevation reservoirs. During peak demand, Switzerland releases this water to produce hydroelectric power, effectively creating large-scale energy storage.

Translating this approach to the United States and Mexico leverages each country's strengths: Mexico's cost-effective labor, materials, and regulatory efficiencies, combined with U.S. expertise in financing, design, and nuclear fuel production.



Grams of carbon dioxide equivalents emitted per Kilowatt-Hour of electricity generated in 2022 (Our World in Data)



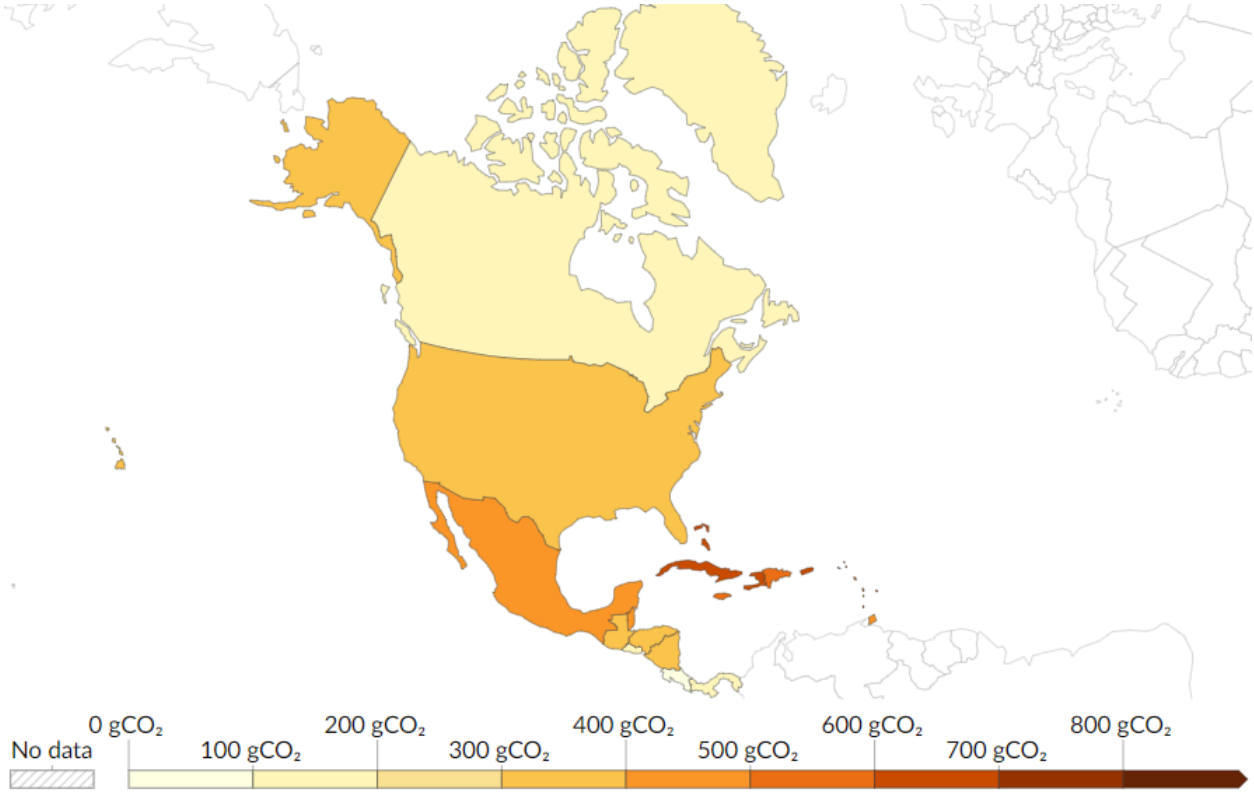
Percentages of total France electricity generation in 2022 by source (IEA)

Percentages of total Switzerland electricity generation in 2022 by source (IEA)

Constructing a **fourth-generation nuclear power plant** at the Texas–Mexico border offers a compelling example of how cross-border synergy can directly enhance energy availability. While the United States brings cutting-edge design, financial investment, and a robust nuclear supply chain, Mexico expedites construction through a shorter regulatory cycle and more affordable labor. This arrangement enables continuous, high-capacity power generation to meet the increasing energy demands of the region and will allow a lower delivered cost of power than could be delivered via a domestic facility.

Moreover, existing infrastructure in Texas—including large-scale battery manufacturing facilities—can be leveraged for critical energy storage. Just as France's steady nuclear output supports Switzerland's hydro-pumping strategy, surplus electricity along the border could be stored in batteries or converted into other on-demand energy forms. Texas A&M University (TAMU), which hosts a leading power-engineering program, can train both American and Mexican engineers to operate and maintain these advanced systems. Four new Small Modular Reactors (SMRs) are currently planned for TAMU's RELLIS campus, helping to create a skilled workforce aligned with long-term economic and security goals.

References and Data Sources:
Kairos Power; TerraPower; IEEE Xplore, 2020; Bloomberg, Europe's Green Battery



Grams of carbon dioxide equivalents emitted per Kilowatt-Hour of electricity generated in 2022 (Our World in Data)

Percentages of total Mexico electricity generation in 2022 by source (IEA)

Percentages of total United States electricity generation in 2022 by source (IEA)

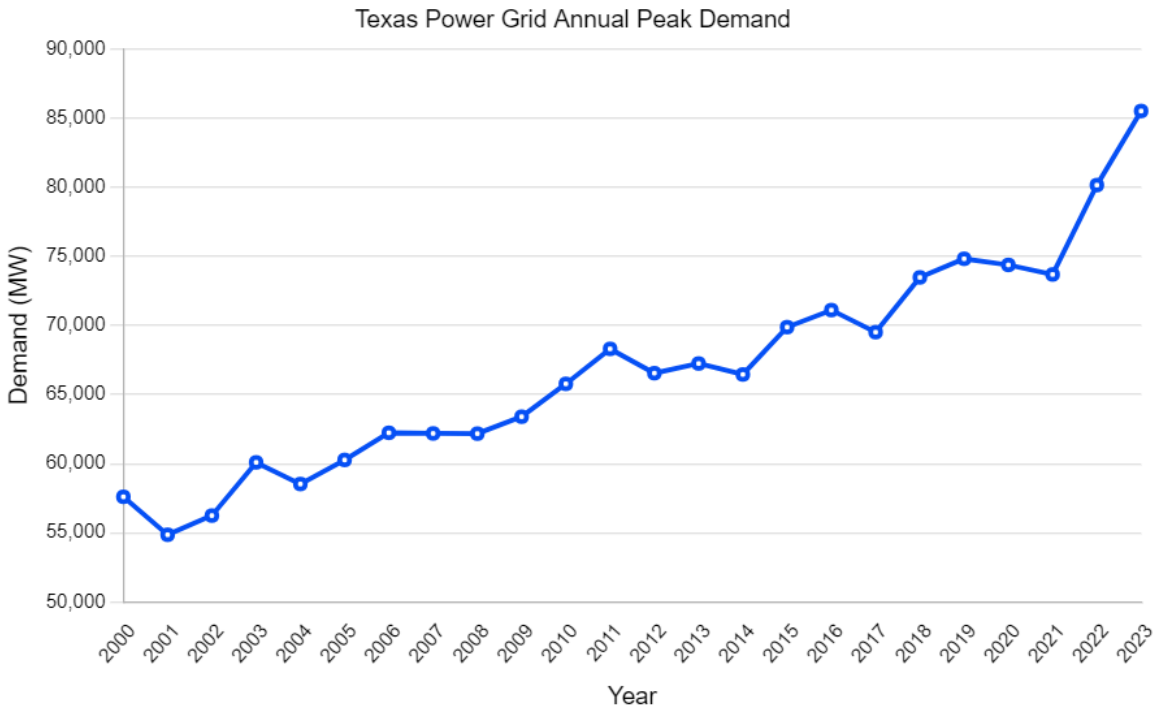
Economic Prosperity:

Cross-border **Economic Battery** communities—industrial hubs supported by abundant, reliable electricity—can drive American growth and job creation. Stable, low-cost power draws manufacturing, technology, and other energy-intensive industries, fostering local prosperity and

possibly mitigating migration by providing attractive opportunities at home. Public and private investments in these communities ripple outward, improving infrastructure, increasing consumer spending, and strengthening binational cooperation.(Carnegie Endowment, 2023).

Enhancing the Texas Power Grid:
Recent events have highlighted the vulnerability of the Texas grid, which struggles during peak demand and extreme weather. Integrating a nuclear plant with supporting storage capabilities directly at the Texas–Mexico border provides a dependable energy influx that can stabilize regional supply. Nuclear power's high capacity factor ensures a steady flow of baseload electricity, while storage systems add critical flexibility and resilience.

Looking beyond the immediate region, implementing border-based solutions helps diversify the power mix and fortify energy security for both countries. Mexico's existing Laguna Verde Nuclear Power Plant, operating since 1990, signals a readiness to embrace nuclear as part of its broader energy portfolio. With U.S. capital and design support, Mexico could develop more advanced reactors that bolster reliability on both sides of the border—securing a dependable grid that meets industry demands.



A Blueprint for Success:
By capitalizing on cross-border economic and cultural benefits, the Economic Battery model not only strengthens national security but also serves as a beacon for bilateral prosperity and collaboration. The success of sustained nuclear power from France and the utilization of Switzerland's hydro-electricity to “recharge” by pumping water into higher elevation lakes during lower-use times, then releasing the water during peak use to supplement the nuclear power with hydro-electric power, is the cleanest atmospheric climate solution with high-density power available globally. As we translate this to other nations and cities, each particular site would define which clean energy storage systems would be optimal. This model could also be applied to other critical developing technologies, such as desalination.

Conclusion:
Cross-border energy collaboration represents a powerful tool for meeting modern electricity needs while boosting prosperity and security. By uniting each nation’s comparative advantages—from Mexico’s cost-efficient labor and streamlined regulatory approach to the United States’ technological, financial, and engineering expertise—both countries can ensure a robust, round-the-clock power supply that fuels industrial growth, encourages educational opportunities, and stabilizes the grid in crisis situations.

Adapting the successful Franco-Swiss “Battery-of-Europe” model to the Texas–Mexico border thus stands as a strategic blueprint for regional energy security. Through these partnerships, nations can secure the critical power they need, avert grid disruptions, and create the economic foundation for resilient and thriving border communities.

For more information on Open Power & Energy Network Collaborations please contact Dr. Kleck at Jeff@OpenPowerEnergy.Net.

Citations:

- Swissinfo - Switzerland's Giant Water Battery
- Kairos Power - 4th Gen Nuclear Power
- Terra Power - 4th Gen Nuclear Power
- IEEE Xplore - Cross-Border Engineering Collaborations
- Bloomberg - Europe's Green Battery
- Carnegie Endowment - Clean Energy Supply Chains
- ASEE - Cross-Border Collaborative Learning
- ERCOT Peak Demand Records
- Our World In Data - Carbon Intensity of Electricity Generation
- IEA - World Energy Transitions Outlook
- IEA - Countries

Data Citation Details:
Our World in Data - Maps
Ember - Yearly Electricity Data (2023); Ember - European Electricity Review (2022); Energy Institute - Statistical Review of World Energy (2023) – with major processing by Our World in Data
IEA - Graphs
Blue shades present power sources in order of increasing grams (g) of carbon dioxide (CO_2) equivalents emitted per Kilowatt-Hour (kW h) of electricity generated levels from left to right including Wind, Nuclear, Tide, Hydro, Geothermal, Solar PV, Solar Thermal
Gray shades present power sources in order of increasing grams (g) of carbon dioxide (CO_2) equivalents emitted per Kilowatt-Hour (kW h) of electricity generated levels from left to right including Biofuels, Waste, Oil, Natural gas, Coal

The Author:
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